



GRADE 7 · RATIOS & PROPORTIONAL RELATIONSHIPS

MULTI-STEP RATIO PROBLEMS

Today's goal: I can solve multi-step ratio problems, including by using proportional relationships.



Tan



Digit



Blaze



Pi



WARM-UP

Turn & talk · 1 min

3 books cost \$12

1 What do 5 books cost?

TURN & TALK

is it \$14 or \$20?



Find ONE first

1 $\$12 \div 3 = \$4$ per book.

2 $5 \times \$4 = \$20$.



BIG IDEA 2

Why \$14 fails

- 1 Adding 2 books and \$2 keeps the DIFFERENCE.
- 2 But $\$14 \div 5 = \$2.80$ per book — the price changed.

REMEMBER

Ratios scale by multiplying. Never by adding.



Or use the scale factor

1 7 kg takes 21 min. For 10 kg: $10 \div 7 = 10/7$.

2 $21 \times 10/7 = 30$ min. Same answer, fewer steps sometimes.



BIG IDEA 4

Sharing a total: find ONE PART

- 1 Blue : yellow = 3 : 2 in 20 litres.
- 2 $3 + 2 = 5$ parts. $20 \div 5 = 4$ litres per part.
- 3 Blue 12, yellow 8.

REMEMBER

Check BOTH: they sum to 20, and $12 : 8 = 3 : 2$.



SPOT THE SLIP!

Turn & talk

Something went wrong here...

THE PROBLEM

2 pens cost \$3. What do 8 pens cost?

WHAT A STUDENT DID

Answered \$9 by adding 6 to both.

YOUR MISSION

What went wrong? What's the right answer?



2 pens cost \$3. What do 8 pens cost?

1 Per pen: $\$3 \div 2 = \$1.50$. Eight pens: $8 \times \$1.50 = \$12$.

2 Or scale: $8 \div 2 = 4$, so $\$3 \times 4 = \$12$.

Answer: **\$12**



Pick your pepper!

**1 MILD**

5 metres of rope cost \$40.
What does 1 metre cost?

#1 on your practice sheet

**2 MEDIUM**

A machine packs 7 kg in
21 minutes. How long for
10 kg?

#3 on your practice sheet

**3 SPICY**

Show that 24 minutes
cannot be right, using the
rate per kilogram.

#7 on your practice sheet

How's it going?



3 • Got it!

I could teach it



2 • Almost

One more example, please



1 • Not yet

I need some help

NOW YOU!

Practice sheet: everyone does Mild & Medium, then climb the peppers.

Stuck? Look back at Mr DJ's example at the top of the sheet.

Need it again? Step-by-step videos on YouTube @MathWithMrDJ

Brain break: 3 new daily puzzles at puzzles.mathwithmrdj.com

